



QUICK REVISION MODULE [UPSC PRELIMS 2022]
GEOGRAPHY

**DIFFERENT TYPES OF
IRRIGATION
AND IRRIGATION SYSTEMS**

Irrigation and Benefits of Irrigation

The process of supplying water to crops by artificial means such as canals, tube wells, tanks etc. is known as irrigation.

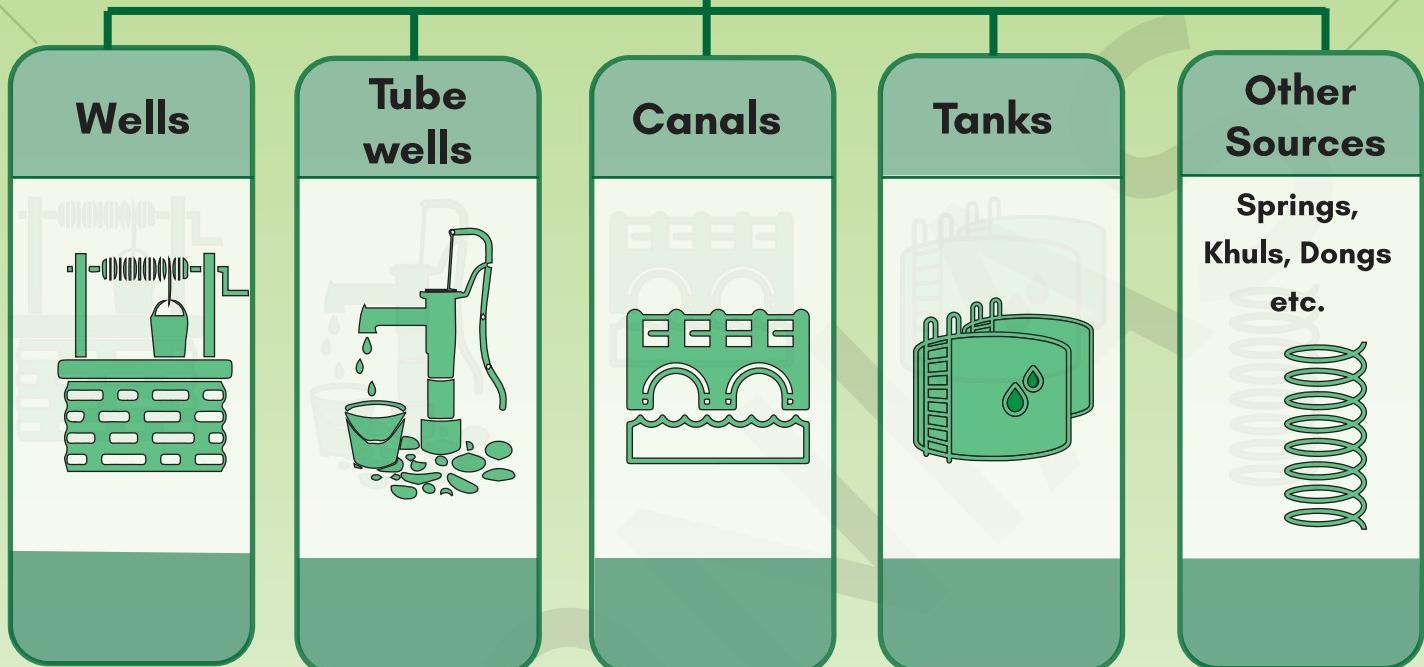
Total Area	322 mha	100%
Total Cropped Area	192.2 mha	59%
Area Under Irrigation	67.2 mha	20%
Total Irrigation Potential	139.5 mha	43%

Benefits of Irrigation System

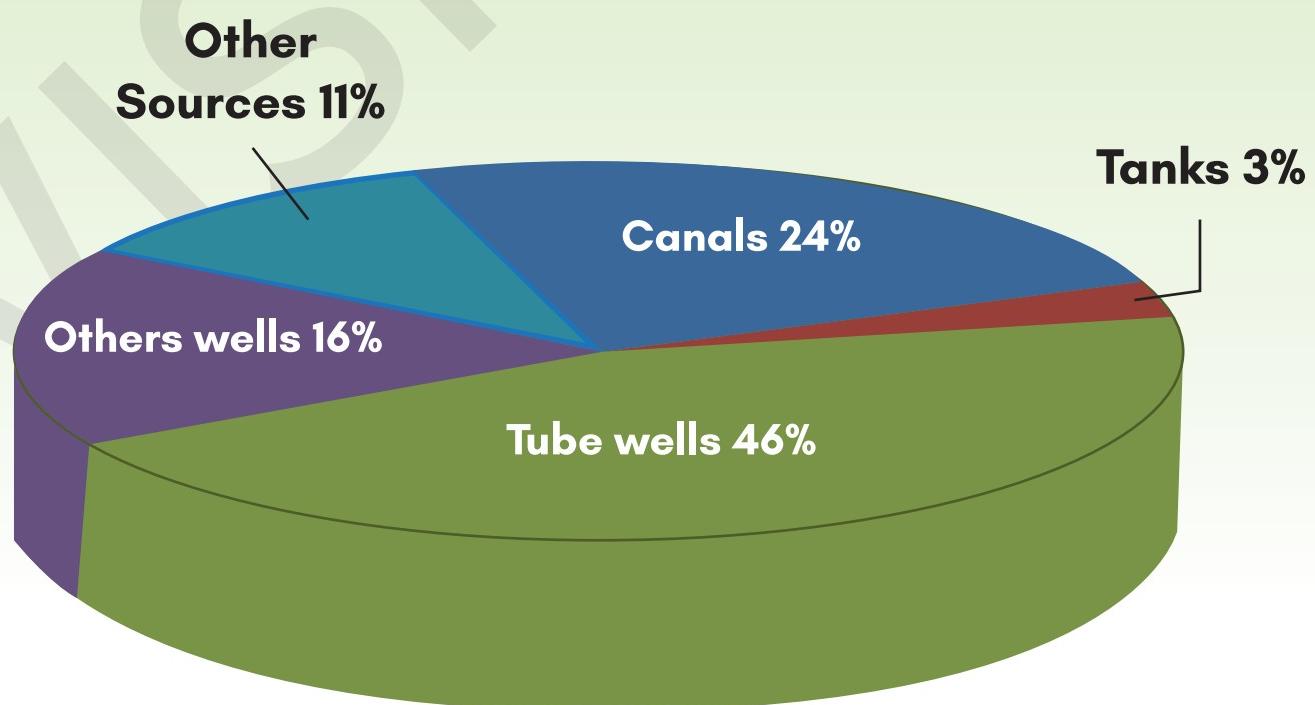


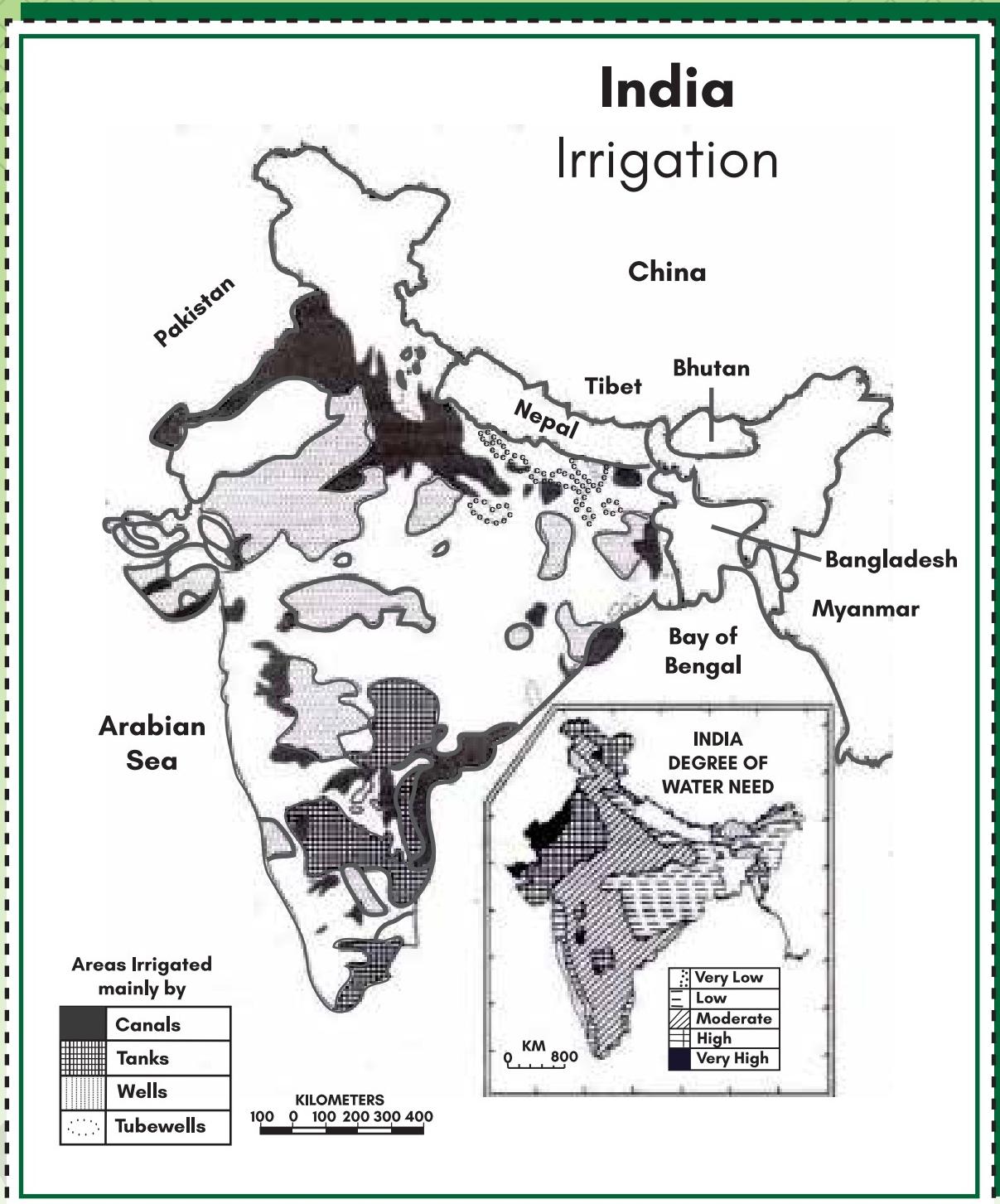
CLASSIFICATION OF IRRIGATION SCHEMES

Based on Sources



Percentage wise distribution of Irrigation sources





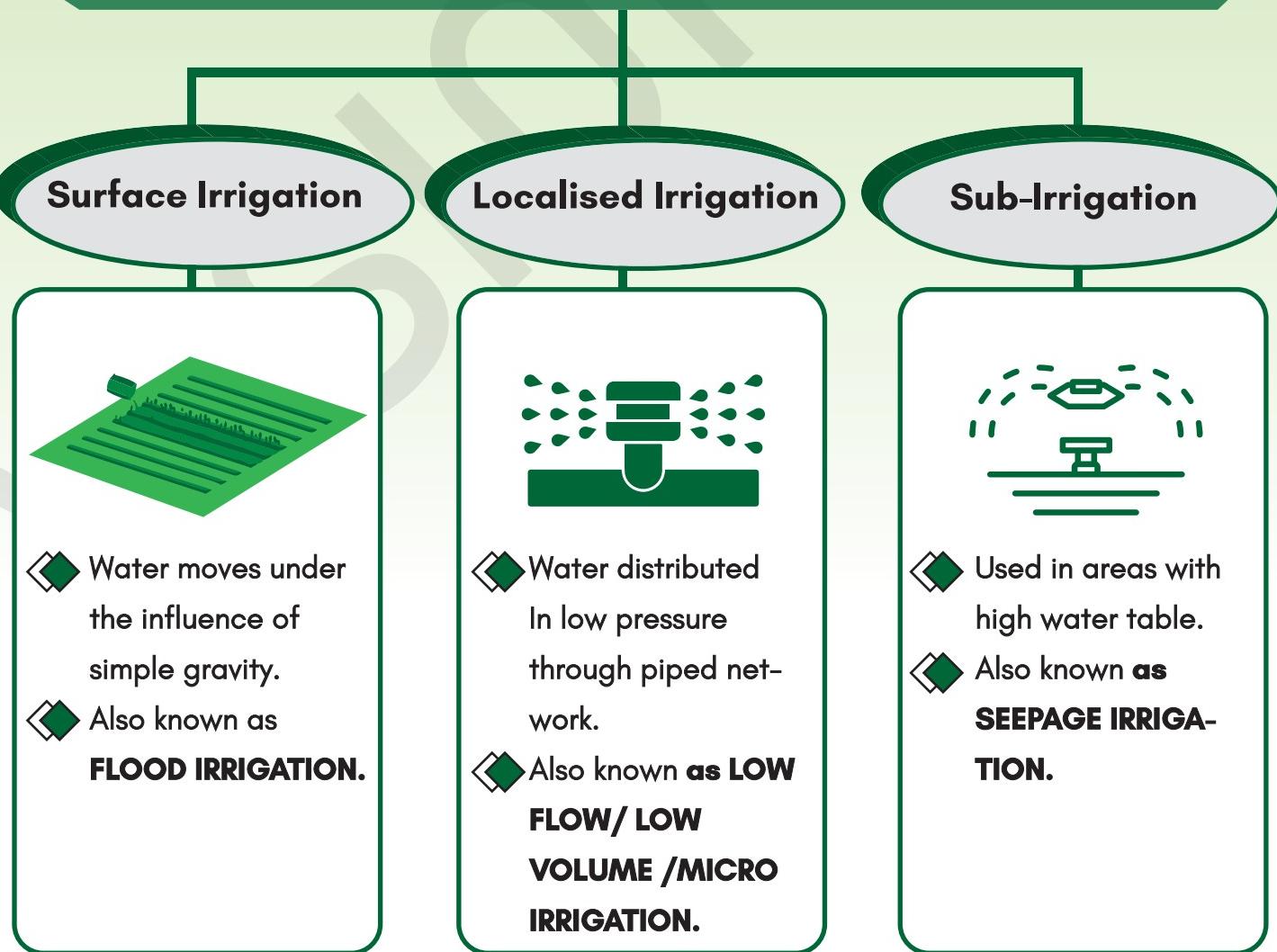
Based on Magnitude

Irrigation Projects in India are classified into three categories on the basis of Culturable Command Areas (CCA) as:

Projects	Basics of Categorisation (CCA)
Major	more than 10,000 hectare
Medium	2,000 hectare < CCA < 10,000 hectare
Minor	2,000 hectare or less CCA

- ◆ Minor irrigation projects have both surface and ground water as their source, while Major and Medium projects mostly exploit surface water resources.
- ◆ Minor irrigation scheme's contribute a major share in the growing irrigation across the country accounting for about 65% of the total irrigation potential utilized.
- ◆ The Minor irrigation scheme has been categorised broadly into five major types, namely:
 1. Dugwell
 2. Shallow tubewell
 3. Deep tubewell
 4. Surface flow schemes
 5. Surface lift schemes

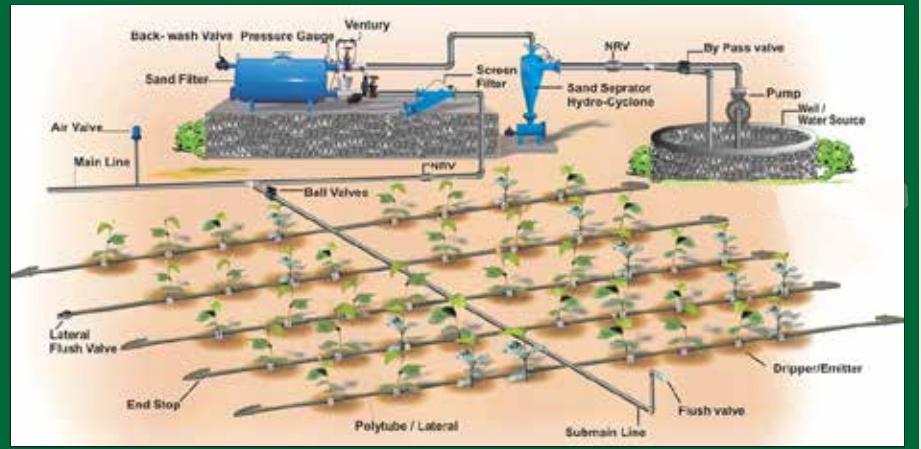
Based on Technique of Distribution of Water



Surface Irrigation Types

Basin Irrigation	<ul style="list-style-type: none">◆ For small areas, having levelled surface, surrounded by earth banks.◆ Water is applied & allowed to infiltrate & then diverted to another field.
Furrow Irrigation	<ul style="list-style-type: none">◆ Conducted by creating small parallel channels along field length.◆ Water flows from one corner of furrow to other under the influence of gravity
Border Strip Irrigation	<ul style="list-style-type: none">◆ Field is divided into bays or strips.◆ Can be considered as combination of basin and furrow irrigation.◆ Also known as Border Check/Bay Irrigation.

Types of Localised Irrigation

Drip Irrigation	 <p>The diagram illustrates a drip irrigation system setup. It starts with a 'Pump / Water Source' connected to a 'Sand Filter'. A 'Screen Filter' is placed before a 'Sand Separator Hydro-Cyclone'. The system includes a 'Venturi' for backwash, a 'Pressure Gauge', and 'Air Valve' on the main line. The water then flows through a 'Polytube / Lateral' line, which branches into 'Submain Line' sections. At the end of each lateral, there is a 'Flush valve' and a 'Dripped/Emitter' for applying water directly to the soil. The field is shown with rows of young plants being irrigated.</p> <ul style="list-style-type: none">◆ Also known as TRICKLE IRRIGATION.◆ Water delivered at or near root zone drop by drop.◆ FERTIGATION -Fertilizer delivery through drip irrigation.
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Sprinkler Irrigation



- ◆ Also known as **OVERHEAD IRRIGATION**.
- ◆ High pressure sprinkles are mounted at permanent places.

Challenges

1. Expensive initial infrastructure.
2. Wasteful of water and resources.

Based on the Way the Water is Applied

Flow Irrigation System

- ◆ Irrigation water is conveyed to the irrigated land.

Direct Irrigation

Irrigation water is directly obtained from river without any storage.

Reservoir/Storage/Tank

Water from river stored in an constructed obstruction Eg. dam across river.

Lift Irrigation System

- ◆ When water to be used for irrigation is available at a lower level.
- ◆ Lifted by pumps or other mechanical devices.
- ◆ Example -used at many places in Indra Gandhi Canal (Rajasthan).

On the Basis of Duration of Application

Inundation /Flooding Type Irrigation System

- ◆ Land is allowed to get inundated by water, saturating the soil.
- ◆ Excess water is subsequently drained off.
- ◆ Uses flood water of rivers for the purpose thus limited to few days of the year.

Perennial Irrigation System

- ◆ Water is supplied according to crop water requirement at regular interval.
- ◆ Source of water can be surface or ground water.

On the Basis of choice of Irrigation Method

Method	Suitable for crops
Border Strip Method	Wheat, Leafy Vegetable, Fodders
Furrow Method	Cotton , Sugarcane , Potatoes
Basin Method	Orchard Trees

Irrigation Efficiency

- ◆ Irrigation efficiency is defined as the ratio between the water stored in the soil depth inhabited with active plant roots to the water applied by the irrigation system.
- ◆ Irrigation efficiency of 100% are practically non existent, due to following reasons :
 - ◆ Inability to obtain an accurate estimate of quantity of water needed to recharge the soil root zone depth.
 - ◆ Lack of valid , real time information concerning the actual soil depth of active roots.

Virtual Water

- ◆ The concept of “virtual water” was introduced by Prof. Allan in the early 1990s and refers to the water that is required for the production of agricultural commodities, or in other words the water “embedded” in agricultural products.
- ◆ Water trade refers to the idea that when goods and services are exchanged, so is virtual water. When a country imports one tonne of wheat instead of producing it domestically, it is saving about 1,300 cubic meters of real indigenous water.

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DELHI



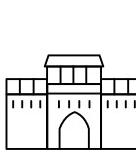
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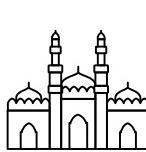
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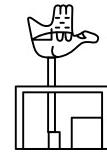
HYDERABAD



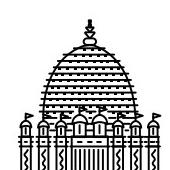
PUNE



AHMEDABAD



CHANDIGARH



GUWAHATI